

Pœcilogony is therefore a practical possibility: and since this is so it follows that the biologist undertaking operations with groups of organisms in which this phenomenon exists can not safely rely on the appearances presented by any given stage of the animal with which he has to deal: but must acquire a thorough knowledge of it in all the transformations through which it passes in the cycle of its development.

Finally, it is of interest to note that although such cases as the one studied in this paper may be considered as illustrations of certain special modes of the transformations of species—the differences between the larvae being interpreted as the result of the action of different environments or the resemblance between the adults as convergence resulting from the action of similar environments on forms originally unlike—nevertheless as the mathematical example shows, these cases could exist were species as fixed or immutable as are the mathematical formulae for the curves given above. Such cases can not therefore be considered as furnishing evidence for the transformist hypothesis as they can be perfectly understood without reference to this theory.

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#### NEW SPECIES OF CICADELLIDAE (HOMOPTERA) FROM THE EASTERN AND SOUTHERN UNITED STATES.

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This paper presents the descriptions and figures of eleven new species of Cicadellidae (Jassidae) including original descriptions of the males of two species previously described. The types, where not otherwise indicated, are in the collections of the authors at Harrisburg.

##### ***Chlorotettix dozieri*, n. sp.**

Plate 11, Fig. 1, 1a, 1b.

A species with broadly rounded vertex, in general appearance greatly resembling *viridius* but slightly larger with distinct genital characters. Length 6 mm.

Form rather stout and robust. Vertex broadly rounded and parallel margined, a little more than twice as wide between the eyes as the length at middle. Pronotum more than twice as wide as long and less than twice as long as vertex. Scutellum as long as pronotum. Elytra rather short and broad with a small appendix.

Color: Varying from pale yellowish green to bright apple green as in *viridius* and without definite markings. Legs dark green.

Genitalia: Female last ventral segment more than three times the length of preceding. Lateral angles strongly produced and broadly rounded either side of a deep V-shaped notch two thirds distance to base; lateral margins of notch sinuate to a small rounded median notch either side of which is a small indentation. Pygofers narrow, outer margins straight. Male valve one and one-half times as long as last ventral segment, very bluntly angled. Plates four times as long as valve, broad at base, outer margins convexly rounding to near the apices where they are slightly concave forming bluntly rounded tips. Apical third of plates bent upward.

This species might easily be taken for *viridius* without examination of the genital characters.

Described from one female and five males collected by H. L. Dozier, at Helena, Mississippi, July 18, 1920. Mr. Dozier had labeled the species *C. suturalis*? and stated in an accompanying letter that these were taken abundantly while sweeping among cypress shrubs. Most of the species of the genus are grass and sedge feeders, and if this occurs on Cypress it is an interesting addition to the known food plants of the group. We take pleasure in dedicating this species to the collector.

#### ***Chlorotettix fallax*, n. sp.**

Plate 11, Fig. 2, 2a.

Resembling *Ch. tergatus* in appearance, size and coloration, but with male genitalia very similar to the much smaller *Ch. viridius*. Length of male, 7.5 mm.

Vertex broadly rounded and almost parallel margined. Elytra subhyaline as in *tergatus*, and somewhat smoky at tips.

Male genitalia with valve slightly more than one-half length of preceding segment; convexly rounded but scarcely angled; width of plates together at base twice their length, very strongly and convexly rounded, and semicircular in outline.

Described from a single male specimen swept from prairie grasses in the Everglades, Paradise Key, Fla., Apr. 10, 1921, by D. M. DeLong.

#### ***Chlorotettix divergens*, n. sp.**

Plate 11, Fig. 3, 3a, 3b.

In size and coloration resembling *tergatus* but with a bluntly angled, produced head and very different genital characters. Length 7 mm.

Vertex bluntly, angularly rounded, almost one-third longer on the middle than next the eyes, not quite twice as wide as long. Pronotum less than twice the length of vertex, elytra long, tips appressed. Face almost as wide as long, gradually narrowed to clypeus.

Color: Face, lorae, clypeus and genae greenish yellow, unmarked; vertex, pronotum and scutellum dark greenish yellow, irregularly marked with darker

areas. Elytra sordid greenish hyaline often smoky toward the tips, the dark veins of the wings showing through them. Beneath greenish.

Genitalia: Female last ventral segment more than twice as long as preceding, lateral margins convexly rounded to prominent, bluntly pointed lateral angles either side of a deep "U"-shaped excavation extending two-thirds the distance to the base with the apex slightly notched, exposing base of ovipositor. The basal portion of concavity narrowly brown bordered. Male valve rounded, longer but narrower than last ventral segment. Plates twice longer than valve and broader at base, outer margins strongly convexly rounded two-thirds the distance to the apex where they are distinctly narrowed and produced into long divergent tips. Secondary brown foliaceous plates are visible at the margins of the ventral plates.

Described from six female and twelve male specimens collected at Cape Charles, Va., by the Junior author, August 2 and 3, 1920. They were swept from patches of tall grasses growing in pine woodland.

***Chlorotettix latifrons*, n. sp.**

Plate 11, Fig. 4, 4a.

Resembling *unicolor* in size and form, but dull greenish yellow in color and with distinct genitalia. Length 8 mm.

Vertex broadly rounded, parallel margined, more than twice as wide as long, and strongly rounded to front. Pronotum twice as long as vertex. Face very broad, gradually narrowed to clypeus.

Color: Dull yellow without definite markings, often spots or blotches slightly bronzed and usually a darker blotch on apex of vertex. Veins somewhat darker especially on the smoky apical portion.

Genitalia: Last ventral segment of female longer than preceding. Lateral angles rounded but prominently produced. Between these the posterior margin is strongly concavely excavated half way to the base, in the middle of which is a rather V-shaped notch extending entirely to the base. The notch and posterior margin are broadly bordered with dark brown.

Because of the large size and distinct genital characters it is strange this species has not been previously captured and described.

Described from two female specimens collected by the junior author at Cape Charles, Virginia, August 3, 1920, swept from very coarse sedges on the sandy margins of a salt marsh, and a female specimen received from Mr. H. L. Dozier taken at Pascagala Mississippi.

***Chlorotettix capensis*, n. sp.**

Plate 11, Fig. 4, 4a.

A narrow yellow species with bluntly angled head. Length of male and female 6 mm.

Length of vertex equals one half width between eyes, strongly produced. Pronotum almost twice as long as vertex, very convex anteriorly.

Color above dull greenish yellow; elytra subhyaline; paler beneath; eyes rich maroon in fresh specimens.

Genitalia: Female last ventral segment equals preceding one, lateral angles strongly produced, slightly rounded; posterior margins shallowly concave to prominent rounded angles either side of a narrow V-shaped notch extending two-thirds of distance to base; median notch broadly bordered with brown. Basal pieces of ovipositor plainly visible behind posterior segment. Male valve bluntly angled, length one-half the width; plates exceeding valve by more than its length, gradually narrowed toward tips which are broadly rounded to distinct inner angles.

Described from four specimens collected from *Panicum hemitomum* (Maiden Cane) at Paradise Key, Fla., Apr. 6-9, '21, by D. M. DeLong; 2 specimens same locality, Apr. 1 and 9, 1919, by C. A. Mosier; also 4 specimens from Cleveland, Fla., Apr. 25-28, one from Miami, Fla., Apr. 12, and one from Ft. Myer, Fla., Apr. 24, collected by DeLong in 1921.

#### ***Chlorotettix productus* S. & DeL.**

Plate 11, Fig. 6.

This species was described<sup>1</sup> from female specimens only collected at Battle Pt., Va., by the senior author. Numerous females have been collected at LaBelle and Cleveland, Fla., by D. M. DeLong, as well as males which apparently belong to this species, and are here characterized for the first time.

Male, dull yellowish green, as in the female. Length, 4.5 mm.

Genitalia: Male valve triangular with apex rounded, equal in length to preceding segment. Plates exceeding valve by almost twice its length, lateral margins almost straight, gradually narrowed to rather broad, blunt apices.

#### ***Chlorotettix minimus* Baker.**

Plate 11, Fig. 7, 7a, 7b.

Resembles *Ch. viridius* VD. in form and color, but is closer to *Ch. productus* S. & DeL., in size and genital characters. Length of female 5 mm.; male, 4.5 mm.

Vertex bluntly rounded and slightly produced, twice as wide as long. Elytra pale subhyaline and faintly smoky at tips.

Genitalia: Female last ventral segment twice the length of preceding with lateral margins gradually sloping to the posterior margin, which is strongly produced at middle. A narrow sinuate incision extends nearly to the base of posterior segment, forming a small rounded projecting inner lobe, bounded outwardly by a concave emargination often forming a small indistinct secondary lobe from which the margin slopes gradually toward the base. Male valve broadly rounded, almost twice the length of preceding segment. Plates exceed

<sup>1</sup>Am. Entom. Soc. Amer. XII, p. 236 (1919). Figures.

valve by two and one-half times its length, broad at base, gradually and evenly narrowed to sharp-pointed tips.

Eighteen specimens were collected at Miami, Cleveland and La Belle, Fla., Apr. 2-28, 1921, by D. M. DeLong from coarse grasses.

*Note:* In Baker's original description (Can. Ent. XXX, p. 220, 1898) he ascribes to *minimus* a male collected at Corumba, Brazil, which doubtless is the male of another species (undetermined), the female of which was collected at this place and is labeled erroneously as "*Ch. minima*" var. The females of typical *minimus* were collected at Chapada, Brazil. This is therefore the first description of the true male of *Ch. minimus* Baker.

The male Chlorotettix originally ascribed by Baker to *minimus* and the female labeled as "*Ch. minima* var." both of which were collected at the same place in Brazil are described below.

#### **Chlorotettix bakeri**, n. sp.

Plate 11, Fig. 8, 8a.

This species resembles *Ch. minimus* in size and form, but differs strikingly in the genital characters.

Female last ventral segment about twice as long as preceding segment; lateral angles broadly rounded to posterior margin which is broadly and roundly notched one-third distance to base of segment. Male valve equals preceding segment in length, broadly and evenly rounded; plates about four times as long as valve, broadly and convexly expanded toward the base, then abruptly and concavely narrowed two-thirds their distance to apex forming narrow rounded tips.

A male (holotype) and female specimen in the Baker collection, U. S. Nat. Museum labeled "Corumba, Brazil, May." U. S. Nat. Mus. Type No. 24951.


The male specimen was labeled originally "*Chlorotettix minima*"; and the female as "*Ch. minima* var" by C. F. Baker.

#### **Chlorotettix excultus**, n. sp.

*Chlorotettix minimus* DeLong, Bull. Ohio St. Univ. XXIII, No. 15, p. 21, Figs. 18 a and 18 b (1919), cited in error.

The description and figures appearing as above were prepared from two specimens, one each from Florida and Jamaica, loaned to the junior author by Mr. E. P. Van Duzee and labeled "*Ch. minimus* Baker." On examination of Baker's types, it became evident that these specimens were erroneously identified, and that they require a new specific name. No description is appended on account of the availability of the description and figures as cited above. The type is from Florida and has been

returned to Mr. Van Duzee and doubtless is in his collection at the present time.

**Phlepsius cottoni**, n. sp. =   
Plate 12, Fig. 1, 1a, 1b.

A blunt headed, rather robust species resembling *incisus* in size and form but with unusually distinct genital characters. Prevailing color pale. Length: female 6.5 mm.; male 6 mm.

Vertex very blunt and almost parallel margined, a little longer on middle than next the eyes, more than three times as broad as long and broadly rounding to the front. Pronotum more than twice as long as vertex and twice wider than long. Elytra rather broad and flaring at tips. Face broad and convexly rounded.

Color: Vertex, pronotum, scutellum and face white, rather heavily but irregularly irrorate with brown. Scutellum more heavily marked, with three conspicuous white spots, one at apex and one midway on either side. Elytra white rather sparsely and irregularly inscribed with brown. Posterior half more heavily inscribed, apex and spots along costa dark brown.

Genitalia: Female last ventral segment twice as long as preceding. Side margins abruptly narrowed about one-third the distance to apex, then convexly produced to posterior margin which is slightly sinuated forming four indistinct lobes, a small one at either side and two larger ones at middle, the latter two separated by a rather broad shallow notch. Male valve triangular, almost equilateral, longer than last ventral segment; plates divergent, produced the length of valve beyond its apex, outer margins at base almost straight then abruptly narrowed at two-thirds their length to the robust, parallel margined and bluntly rounded apices.

Described from five females and one male; one female collected by R. T. Cotton, Orlando, Fla., Aug. 20, 1920; three females collected at Cleveland, Fla., Apr. 26, 1921, and a pair at Orlando, Apr. 29, 1921, by D. M. DeLong.

**Phlepsius planus**, n. sp.

Plate 12, Fig. 4, 4a, 4b, 4c.

A plain undecorated, buff species resembling *Ph. nebulosus* in size and color-tone, but with a short sharp vertex. Length of female, 8 mm.; male, 7 mm.

Vertex short, almost parallel-margined, margin somewhat compressed and slightly upturned, four times as wide as long, and less than half the length of pronotum. Elytra broad and flaring.

Color: Face, vertex, pronotum and scutellum irregularly and sparsely marked and inscribed with dull brown. Markings of elytra very sparse, following the veins or in linear pattern. Two female specimens show a distinct brownish spot near middle of elytra. General color-tone above and below is dull buff.

Genitalia: Female last ventral segment more than twice length of preceding. Lateral angles strongly produced and rounded either side of a broad rectangular

excision one-fourth distance to base, the posterior margin of which is produced and angularly notched at middle forming two broad brown teeth. Male valve distinctly triangular and pointed at apex, exceeding length of preceding segment. Plates exceed valve by three times its length, somewhat concavely narrowed from base to small blunt tips.

Described from twenty-three specimens from Paradise Key, 22 collected by D. M. DeLong, Apr. 5-10, 1921, swept from *Panicum hemitomum* (Maiden cane) in the everglades, and one specimen collected by Schwarz and Barber, U. S. National Museum Collection, Feb. 19, 1919; also one specimen collected at Cleveland, Fla., Apr. 25, 1921, by J. N. Knull.

**Thamnotettix virginianus**, n. sp.

Plate 12, Fig. 2, 2a, 2b.

Resembling *fitchii* in size and general appearance but with blunter head, strongly marked with orange stripes and with distinct genital characters. Very similar to *Thamnotettix aureovitattus*.<sup>1</sup> Length: female, 4 mm.; male, 3.5 mm.

Vertex blunt, almost rounded, a little longer on middle than next eyes and a little broader at base between eyes than length at middle. Pronotum twice as wide as long, longer than vertex. Elytra long, greatly exceeding abdomen.

Color: Dull yellowish marked with black and orange. Vertex with ocelli and four spots above margin black. Two approximate ones at apex and a somewhat larger one either side just above ocellus. Vertex washed with orange, a definite longitudinal stripe either side extending across pronotum and onto scutellum. Pronotum with two fainter longitudinal stripes either side behind eyes. Elytra orange shading to dusky orange at apex; veins pale, smoky margined on posterior portion. Beneath dull yellow, marked with orange.

Genitalia: Female last ventral segment about one-half longer than preceding. Posterior margin convexly rounding and slightly notched either side of a central, rather narrow blunt embrowned tooth, produced at least one-third the length of the segment. Male valve as long as last ventral segment, broadly convexly rounded. Plates two and one-half times longer than valve, broad at base, gradually narrowed to closely appressed tips which together are broadly rounded.

Described from two female specimens from Cape Charles, Virginia, collected by the junior author, July 31, 1920, swept from tall grasses along the sandy shore; and a male specimen collected at Battle Point, Virginia, June 22, 1918, by the senior author.

**Typhlocyba inscripta**, n. sp. = *Eupteryx stellulata*

Plate 12, Fig. 3, 3a, 3b, 3c.

A milky white species with bizarre brown markings on apical portion of wings. In general appearance resembling species of *Empoa*. Length 4 mm.

Head rounded before, twice as wide between eyes as length at middle. Pronotum more than twice as long as vertex and much broader, with humeral

<sup>1</sup>Penna. Bur. Plant Industry, Tech. Ser. Bull. 1, p. 16 (1920).



angles produced and rounded. Elytra long, narrow, broadly rounded on outer apical margin and concavely truncate toward inner margin. Two apical veinlets reflexed to costal margin.

Color: Face, vertex and scutellum white, washed with yellow. Pronotum and elytra milky white, the latter with a large central area on apical cross veins dark brown. From this area a number of brown lines radiate to apex, costa and corium, following the veins; with an irregular brown band returning diagonally toward middle of costal margin. Venter black, borders of abdominal segments and male genital plates pale.

Genitalia: Female last ventral segment four times as long as preceding, lateral margins strongly produced and rounded. Posterior margin roundly excavated one-third the distance to the base either side of a broad central rounded tooth one-third as broad as the segment and equaling or exceeding in length the lateral angles. Male valve more than twice as long as last ventral segment, posterior margin with broad V-shaped notch extending from the lateral angles one-third the distance to the base. Plates narrower than valve and twice longer, margins almost parallel, tips broadly rounded.

Described from a series of eleven female specimens collected at Kew Garden, London, England, August 27, 1919, by the senior author, and seven male specimens taken from pear tree at New Haven, Connecticut, July 6, 1920, by Mr. B. H. Walden.

We have not been able to identify this species with any described European form, and since a record of its occurrence in the United States should be established we are giving it the above name.

#### DESCRIPTION OF PLATES

##### Plate 11.

1. *Chlorotettix dozieri* n. sp. 1a—male genitalia; 1b—female genitalia.
2. *Chlorotettix fallax* n. sp. 2a—male genitalia.
3. *Chlorotettix divergens* n. sp. 3a—female genitalia, letter *a* obliterated by engraver; 3b—male genitalia.
4. *Chlorotettix latifrons* n. sp. 4a—female genitalia.
5. *Chlorotettix capensis* n. sp. 5a—female genitalia; 5b—male genitalia.
6. *Chlorotettix productus* S. & DeL.—male genitalia.
7. *Chlorotettix minimus* Baker. 7a—female genitalia; 7b—male genitalia.
8. *Chlorotettix bakeri* n. sp. female genitalia; 8a—male genitalia.

##### Plate 12.

1. *Phlepsius cottoni* n. sp. 1a—female genitalia. 1b—male genitalia.
2. *Thamnotettix virginianus* n. sp. 2a—female genitalia; 2b—male genitalia.
3. *Typhlocyba inscripta* n. sp. 3a—female genitalia; 3b—male genitalia; 3c—elytron.
4. *Phlepsius planus* n. sp. 4a—female genitalia; 4b—male genitalia, letter *b* obliterated by engraver; 4c—side view of head.

<sup>1</sup> Block supplied by authors.